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CARDIAC FUNCTION AND HEART FAILURE

AGING IMPAIRS DOBUTAMINE AUGMENTATION OF EARLY DIASTOLIC INTRAVENTRICULAR PRESSURE GRADIENT

ACC Poster Contributions
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Session Title: Myocardial Function/Heart Failure -- Clinical Pharmacologicial Treatment
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Background: Early diastolic left ventricular (LV) filling results from an intraventricular pressure gradient (IVPG) extending from the left atrium to the LV apex. The IVPG reflects ventricular suction and increases in response to adrenergic stimulation.

Methods: Color M mode Doppler (CMMD) images in the apical four chamber view were obtained during dobutamine stress echocardiography at rest, low dose (10 mcg/kg/min) and peak dose (20-40 mcg/kg/min) with target heart rate achieved. IVPG was calculated using the CMMD data to integrate the Euler equation.

Results: We prospectively studied 58 consecutive patients referred for pharmacological stress echocardiography (Age 60±13 years-old, male 55%), who had no evidence of inducible ischemia during dobutamine infusion. Resting ejection fraction (EF) was 59±8%. Resting Doppler echocardiographic diastolic function was normal in 41%, impaired relaxation in 52% and pseudo-normal filling in 3% based on the mitral inflow pattern. Resting IVPG correlated with E wave velocity (r=0.69, P<0.001) and EF (r=0.27, P=0.037). IVPG increased in response to dobutamine (at rest, 2.58 ±0.16 mmHg; low dose 3.35±0.18 mmHg; peak dose, 3.87±0.19 mmHg; P<0.0001). The response to dobutamine was impaired in people aged over 60 compared with those aged less than 60 (Figure, P=0.007).

Conclusion: Aging impairs the augmentation of IVPG by dobutamine. An impaired response of LV suction to adrenergic stimulation with aging may contribute to exercise intolerance with aging.